Bottom-up collaborative approach to transformative sustainable business model innovation: Developing employee engagement in an incumbent firm

Genet Corine

Grenoble Ecole de Management

corine.genet@grenoble-em.com

Rose Bote

Neoma Business School

rose.bote@neoma-bs.fr

Introduction

Sustainable business model innovation (SBMI) has attracted increasing attention from scholars and managers who perceive it as a way to change business by integrating societal and environmental concerns (Dentchev et al., 2016; Inigo et al., 2017; Laasch, 2018; Perri and Rocha, 2024; Reischauer et al., 2025; Snihur and Bocken, 2022). SBMI can be defined as *"innovation to create significant positive impacts, and significantly reduce negative impacts for the environment and society, through changes in the way the organization and its value network create, deliver and capture value or change their value propositions"* (Bocken et al., 2014, p. 44). While SBMI can be seen as a route for firms to achieve socially desirable objectives (Perri and Rocha, 2024) and green innovation (Reischauer et al., 2025), it can also create direct business benefits such as cost savings and new sources of revenue (Bocken and Geradts, 2020; Schaltegger et al., 2012), improved reputation (Homburg et al., 2013), organizational resilience (Buliga et al., 2016) and employee attractiveness (Greening and Turban, 2000). However, the process of change, particularly in the SBMI context, is intricate (Coffay and Bocken, 2023). The transformation process of existing business models (BMs) towards more sustainable alternatives remains poorly understood (Snihur and Markman, 2023). This is particularly the case for incumbent firms in a changing business environment

(Reischauer et al., 2025; Riandita et al., 2025) and more so if the organization is relatively successful (Schupfer and Soppe, 2025).

Incumbent firms, as established organizations seeking transformation to new logics of value creation, pursue business model innovation (BMI) through an array of BM portfolios at the corporate level (Aspara et al., 2013). These portfolios entail new sustainable business models (SBMs) which operate around the focal firm with new suppliers and activities, and which require the support of organizational actors within conditions of uncertainty (Snihur et al., 2018). Uncertainty here pertains to the possible cannibalization of the core activity by the new BMs or a loss of occupational identity for employees. Unlike start-ups, established firms face strategic, structural, cognitive and emotional tensions that inhibit SBMI efforts (Ilyas et al., 2024). Employee inertia coupled with trade-offs in allocating resources between new and existing BMs further complicate the transformation to new sustainable models. While previous research has predominantly examined the outcomes of transformative change from BMI in the face of external disruption (Cozzolino and Geiger, 2024; Snihur et al., 2018), it has often overlooked the significant influence of organizational contextual factors such as culture, values and people (Demastus et al., 2025).

In this context, employee behavior and engagement become critical drivers of organizational change, particularly in the SBMI process. Studies have recognized the pivotal role of employee involvement in supporting SBMI, emphasizing the need for strong commitment from both managers and employees to overcome obstacles and mobilize resources (Achtenhagen et al., 2013; Halme et al., 2012). While much attention has been paid to the role of management in setting the strategic change process, acquiring essential capabilities and boosting commitment, (Inigo et al., 2017; Loon et al., 2020; Menter et al., 2024; Pinkse et al., 2024; Schupfer and Soppe, 2025), there has been less consideration of the role that employees play in initiating and driving sustainable transformation. This is limiting because employees are

the expert pool, which is considered the greatest resource for incumbents, and they are also the subjects of inertia, which frustrates change efforts. A better understanding of the transformation process in an incumbent firm thus necessitates further investigation of the role of employees in the process. Hence, in this study we aim to explore: *How does employee engagement emerge during the transformation process to new sustainable business models within an established organization?*

To address the above research question, we investigated the transformative efforts of a mature nuclear energy company in France engaged in SBMI. We focused on the business innovation unit and specifically on four new BMs. We employed a qualitative methodology to uncover the path towards transformation. Based on data from interviews, observations and secondary documents, we found a bottom-up collaborative approach to developing SBMs. In this approach, top management lays the foundation, while the employees' intrapreneurial creativity and experimentation drive the creation of SBMs. Critical to this process is the establishment of engagement for the exploration, development and implementation of these models. We identified two key mechanisms – meaningfulness and complementarity – which support and enhance this engagement.

Our work contributes to the SBMI literature by highlighting a bottom-up, collaborative approach to transformation through the voluntary participation and efforts of employees leveraging a platform from top management. This contrasts with the dominant notion of SBMI as the strategic orientation of corporations that are immersed in Corporate Social Responsibility agendas (Laasch, 2019) or the response to dynamic business environments (Heij et al., 2024; Loon et al., 2020; Voegtlin et al., 2022). We also highlight the emergence of sustainability in the BM as a byproduct of the psychological condition of meaningfulness expressed by employees. We depict meaningfulness as an embedded social condition inclusive of personal, organizational and societal goals. We contribute to the literature on engagement by expounding

on the underlying conditions. Meaningfulness is expressed as both a psychological and social condition while availability and safety are expressed as complementarity, which balances core expertise with new activities and encompasses a balanced amount of resources to attain economic, social and environmental goals. On a practical level, we advocate for forums for intrapreneurial creativity in incumbent firms as arenas for unlocking the potential of employees to drive transformation.

Theoretical Background

Sustainable business model innovation (SBMI): the critical role of employees

Inquiries into BMI bring interesting insights on the increasingly dominant role of firms in addressing societal and environmental challenges beyond economic benefits, thereby shifting from a customer and shareholder focus to a multi-stakeholder view (Perri and Rocha, 2024; Snihur and Bocken, 2022). In the face of changing environmental contexts marked by disruptive start-ups and increased pressure from new stakeholders, such as activists and green political parties (Waldron et al., 2022), established organizations must transform to meet the new demands or risk obsolescence and eventually folding. Incumbents traditionally react to these new demands by engaging in mergers and acquisitions to quickly catch up with the disruptive players in the industry (Cozzolino et al., 2018) and gain green legitimacy (Riandita et al., 2025). Incumbents have recently started to experiment with developing new BMs which create and capture value from external sources such as new suppliers and partners (Heij et al., 2024), while leveraging their strategic expert knowledge and extensive resources. Despite this apparent superior position in the market, incumbent firms are plagued with inertia, resource trade-offs and structural inflexibilities, which hamper their ability to pivot and transform their BMs (Kim and Min, 2015; Kirtley and O'Mahony, 2023). Thus, there is a need to balance external and internal knowledge sources and resources to create synergy which propels new transformative BMs without cannibalizing core business units. In the case of SBMI, another barrier to

successful transformation is the disparity in understandings, sustainability perspectives and visions across the organization, where top management's idealized views of company culture fail to permeate the employee level (Coffay and Bocken, 2023).

Top management's orientation and composition have traditionally played a significant role in driving sustainable transformation. Shao and Xu (2024), in a study of the Chinese context highlighted that incumbents are more likely to initiate sustainable innovation when their board of directors possess large informal social capital than otherwise. Narayan et al, (2021), showed that cognitive and ideological diversity in top management teams have the potential to foster BMI both in terms of scope and intensity. We contend that in established firms which seek to establish new SBMs, the cognitive and ideological diversity among employees plays an equal role to the diversity within top management teams. This stems from the understanding that employees in established firms are the creators of new business ideas related to their core competences and different business units and that they are also the drivers of implementation. Top management identifies the need for a new mandate to diversify in order to meet external contextual changes, and employees deliver the expected changes. This is feasible against the backdrop of employee dynamism, which nourishes the prospects for changing roles and responsibilities in espousing alternate BM portfolios. Employees subsequently garner support for the new BM by engaging in relational work to legitimize the BM as sustainable and socially relevant and to match the new normal in the business environment. Girschik (2020) identified two mutually related embedding processes at the individual level and at the interorganizational level as a pathway to developing approval of a socially legitimate status. This implies developing relationships that are backed by organizational support at the individual level and fostering partnerships and social framing of the new BM at the interorganizational level. Such relational work ensures engagement from multiple stakeholders, setting the stage for success in the implementation of the new model.

Hence, from a strategic management perspective, individual behavior and engagement are crucial at times of organizational change (Achtenhagen et al., 2013; Robertson et al., 1993; Shin et al., 2012), and SBMI is no exception. Roome and Louche (2016) emphasized the need for strong commitment from managers and employees, who must also adopt various roles to support the SBMI process (D'Amato and Roome, 2009). Laasch (2019) showed how a CSR initiative of 'being responsible' kickstarted actions from key employees that got translated into artefacts and activities within actor-networks that pervasively changed the BM. Halme et al. (2012) showed how, despite organization-level obstacles, middle managers in a multinational corporation promoted SBMI by bundling and mobilizing resources in a manner akin to bricolage. Others have highlighted the centrality of the workforce with the right capabilities to foster adoption of new BMs. Pinkse et al (2024) developed four firm level levers, re-combinative, collaborative, integrative, and socio-cognitive capabilities that can be employed to reduce constraints faced by incumbents in their effort to achieve net zero emissions. In another study, Loon et al. (2020) identified five essential capabilities – analogical reasoning, sensemaking, dynamic capabilities, organizational ambidexterity and organizational learning – which should be favored by human resource departments in organizations that are looking to engage in transformative BMI. In the same vein, Menter, et al, (2024) showed person-organization fit as a theoretical explanation for failures and barriers to successful implementation of BMIs. Their findings revealed a positive relationship between incremental BMI and perceptions of people-organization fit in explaining the success of transformative BM changes as opposed to radical BMI changes. While these studies underscore the role of the human resources department in acquiring competences, they would benefit from a deeper understanding of the role that employees play in advocating and initiating new SBMs with or without management oversight. Hence, an established firm seeking transformative shifts through BMIs must look beyond diversification and competitive advantage outcomes to

consider establishing an internal creative and participatory atmosphere. This internal outlook highlights the sparsity of knowledge about employee engagement in championing sustainable transformative change in organizations.

Engagement for sustainable organizational transformation

The concept of engagement has been attracting increasing attention in management literature. Kahn (1990) initially described personal engagement as *"the harnessing of organization members' selves to their work roles, by which they employ and express themselves physically, cognitively, and emotionally during role performance"* (Kahn, 1990: 694). Kahn identified three essential psychological conditions for engagement: meaningfulness, psychological safety and psychological availability. Meaningfulness refers to the perception of achieving a return on personal investment in role performance. It involves formal positions that align with a preferred self-image as well as status and influence within the organization. Safety involves the ability to express and utilize oneself without fear of negative consequences for one's self-image, status or career. Availability pertains to having the physical, emotional and psychological resources needed to invest oneself fully in role performance. At first glance, these psychological conditions seem antithetical to the desire of employees to engage with new BMs that could cannibalize their core business and threaten their occupational identity. According to Kahn' standards, employee's engagement in these transformative BMs jeopardizes their chances of a higher formal position, better status and having competent resources/skills to excel in the new BMs. Interestingly, the notions of meaningfulness, safety and availability have shifted over time, with organizations acknowledging responsibilities and seeking to address grand social challenges (Perri and Rocha, 2024).

Employees seek to identify and craft meaning in their lives, particularly with respect to how much they contribute to or impact their society. In this search for meaningfulness, employees may temporally engage in activities that give them a greater sense of purpose in

helping others rather than benefiting them personally (Martela, 2023), thereby justifying their participation in SBMI. Parallel to this notion is the visibility of the social impact being directly proportional to the sense of meaningfulness, which implies that employees tend to increase their commitment when they can see and show the social impact of their work (Schaumberg and Wiltermuth, 2014). This is particularly the case in industries that have traditionally been stigmatized as posing a threat to society, where this motivates employees to take up any chance of rewriting the image of their work as socially beneficial to society, as embodied in SBMI endeavors. In a study that sought to understand employees' perspectives of progressive self-change in the work place, Sonenshein, et al, (2013) found that employees considered 'growing' at work as encompassed within elements of achieving, learning and helping. Helping entails taking both an organizational perspective, to do good as a positive value to society, and an individual perspective, to be helpful to others by taking on new work tasks and a higher sense of agency. In established industries characterized by long tenure and work inertia, the notion of self-growth becomes salient and has real implications for motivation to engage in activities beyond core job requirements and in SBMIs that contribute positively to society from an organizational perspective, while undertaking the new tasks instituted by these transformative BMs. Hence the notions of meaningfulness, safety and availability are shaped by larger societal discourse and are prone to change, with shifting discourse and organizational contexts necessitating reframing by organizational actors (Florian et al., 2019). However, employees in highly competitive work environments who intend to help others can be stifled out if they perceive strong competition between their core BM and the new SBM (David et al., 2021). This casts a new shadow over the notion of engagement, necessitating further investigation.

In recent years, there has been a surge in research which highlights the positive effects of engagement, with studies showing its benefits in improving individual outcomes such as in-role and extra-role work performance (Christian et al., 2011; Eldor and Harpaz, 2016). Engaged

employees display high energy levels and are actively and enthusiastically involved in their work (Bakker and Demerouti, 2017; Vigoda-Gadot et al., 2013). They also manage resources effectively to protect themselves from stress in challenging situations (Bakker and Leiter, 2010; Eldor, 2017).

Scholars have also suggested that engagement can manifest at the collective level. Similar to individual engagement, collective engagement is depicted as a positive, fulfilling and shared motivational state, marked by collective vigor, dedication and absorption (Bakker et al., 2012). This state arises from the shared experiences of employees (Costa et al., 2014; Torrente et al., 2012). Barrick et al. (2015) took the concept further by suggesting that engagement can be viewed as an organizational-level construct. They observed that employees across the organization may share the perception that members collectively invest themselves in their roles. Their study focused on three specific organizational practices: motivating work design, human resource management practices and CEO transformational leadership. These practices can foster the perception that members of the organization are holistically (physically, cognitively and emotionally) invested in their work.

Some scholars have argued that a shared vision within an organization fosters a collective motivational attitude, such as engagement (Bakker and Demerouti, 2017; Eldor, 2020; Eldor and Shoshani, 2017; Torrente et al., 2012). They explain that when employees view themselves as part of a community with common aspirations and strategic directions, they are encouraged to invest their efforts collectively in achieving shared goals. A shared vision is acknowledged as being a strategic organizational resource that enhances motivation, crystallizes a collective identity and encourages collective effort among employees (Carton et al., 2014). Thus, a shared vision is considered to be an antecedent of collective engagement and an existing resource for a company (Eldor, 2020).

According to Torrente et al. (2012), collective engagement emerges through affective and social processes where employees interpret the meaning of the shared motivational environment in which they work. Other research suggests that employees who work in close proximity often experience similar emotions and levels of motivation, and display comparable behaviors and cognitive attitudes (Barsade and Gibson, 2007; Bartel and Saavedra, 2000). In addition to contagion, collective engagement can also be driven by social cognitive processes. This occurs when employees who encounter similar managerial practices, values and work processes consistently communicate, interact and share organizational knowledge, thus preserving their collective experience (Klein et al., 2001). Hence, engagement arises under conditions of close proximity and where interactions in the workplace are favorable for teams or departments.

The aforementioned literature streams highlight the positive implications of engagement both at the individual and collective levels citing personal and organizational benefits. The studies consider the emergence of engagement as a strategic management objective. This perspective ignores the possibility of the organic emergence of engagement from the voluntary actions of employees. To understand how employees within a large organization can become engaged, we focus on the transformative process by which SBMs are formed in established organizations. Transformation in incumbent firms requires the stifling of employee inertia, while sustainability favors an all-hands-on-deck approach. Thus, the SBMI process represents an ideal context for investigating the organic emergence of employee engagement.

Methodolgy

Given the dearth of empirical research on the SBMI process in established organizations, an exploratory qualitative method is suitable for our research (Corbin and Strauss, 1994; Huberman and Miles, 2002). Based on a constructivist interpretive paradigm which enables us to better iterate with our respondents (Justesen and Mik-Meyer, 2012), we chose as our case

study a French multinational company active in nuclear energy industry, with the pseudonym OCLEA, engaged in uranium mining, conversion-enrichment, spent-fuel recycling, nuclear logistics, dismantling and nuclear cycle engineering activities. The company dates back to 1976 and has undergone several structural changes over the years to emerge as a large group with multiple business units. The group offers its customers efficient products and services across the cycle from mining to decommissioning, as well as in conversion, enrichment, recycling, logistics and engineering.

In response to the need for diverse growth opportunities and evolving customer expectations, the company has embarked on an organization-wide BMI program. As a first step, a business innovation team was created in 2018 to explore new value creation models related to the group's core businesses and related businesses consistent with its DNA by leveraging existing assets and expertise. The team set up an exploration process which promoted proposals for new value creation models with the goal to design, experiment and implement these new models within the group's operational business units. So far, a portfolio of 50 BMs, all at different stages, has been proposed.

Looking at the transformative process by which SBMs are formed in this group, we set out to analyze how employee engagement emerges within this company during the transformation process through BMI.

Data collection

The primary objective of our data collection was to gain a better understanding of the process behind organizational transformation through the development of new BMs. We engaged in multiple interactions with the manager of the business innovation team, held informal meetings with team members, and examined various documents related to the portfolio of BMs under exploration.

The outcomes of this initial investigation provided a deeper understanding of the business

innovation team's structure and the logic behind its innovative BM portfolio. With this enhanced insight, we were able to concentrate on four examples of new BMs, delving further into the exploration and implementation processes within the portfolio.

The selection of these four new BMs was based on their representation of the diversity within the portfolio, taking account of factors such as the project development stage, connection to the core business and alignment with organizational transformation goals, all while reflecting new environmental trends.

The first BM, "Alpha", is an innovative service model for non-electronuclear producers of nuclear waste (mainly medical sector). It aims to offer daily support to players in the non-electronuclear sector in managing their nuclear waste. The project was launched in June 2019 and was initially incubated within the Innovation Business unit during its explorative phase. It was subsequently implemented by the company's operational business unit in July 2020. Notably, Alpha was the first project to emerge from the business innovation team.

The second BM, "Beta," focuses on marketing recycled rare earth magnets. These magnets are crucial for the wind power, automotive, aerospace and high-tech industries in Europe. Due to high demand, rare earth elements are facing significant supply risks and price volatility. The value proposition of this BM is to develop an innovative recycling solution that minimizes supply risk, reduces dependency on raw material extraction and promotes a more sustainable material loop, thereby contributing to a reduced environmental impact. Launched in 2021, the project is currently in the pilot test phase.

The third BM, "Gamma," addresses the societal issue of asbestos valorization. The objective is to develop a chemical process for asbestos inerting and value extraction which is both environmentally and economically viable. To capture the market, the treatment cost must be comparable to the storage cost. The project exploration began in 2021 with a technical development phase. This was followed by an industrial pilot phase in 2022 and process

optimization in 2023.

The fourth BM, "Delta," presents an innovative solution for nuclear waste recycling which harnesses the energy value of the nuclear waste. The objective is to mitigate the long-term hazards and thermal load of nuclear waste during storage. This project could significantly enhance public acceptance of nuclear power and reduce the storage footprint and volume.

In the second data collection stage, we conducted 25 semi-structured interviews between May and September 2022 with employees who participated in the exploration and/or implementation processes of these four new BMs. For each of the four BMs studied, we systematically interviewed four categories of employees: the BMI project leaders during the exploration phase within the business innovation team, the managers of the business unit impacted by the BMI project, the innovation business leaders who serve as liaisons between the business innovation team and the business units, and the individuals responsible for implementing the project within the business unit (see Table 1). All interviews lasted an average of 90 minutes except for those with business unit managers, which averaged 30 minutes. Conducted in French, the interviews took place face to face or via videoconference. All interviews were recorded with the consent of the respondents. Each interview was fully transcribed and integrated into Atlas.ti for storage and coding. The data was coded in French and only the quotes of interest were translated into English using Chatgpt.

The interviews focused on exploring the BMI implementation processes, investigating employees' motivations for developing and adopting new sustainable value creation logics and assessing their perceptions of the potential outcomes of the modeling process. Conducted in a semi-structured format, these interviews included follow-up questions based on the participants' responses. To enhance our findings, we triangulated the interview data with internal documents (17 in total), observations of meetings and daily activities (28 pages of

notes) and numerous informal interactions with managers and employees. Table 2 details the various data sources and the triangulation methods employed.

Data analysis

For the data analysis, we adopted a thematic analysis approach to code our primary data (Charmaz, 2014) and used Atlas.ti software. In the initial stage, we developed emerging themes that reflected the genesis of the BMs and their value drivers, identified tensions and synergies that facilitated or hindered the exploration and implementation of the BMs, and captured employees' perceptions of the potential outcomes of these projects. The initial coding of the first BMI Alpha project was conducted independently and in parallel by the two authors. We then shared our codes to establish a common coding structure, which was subsequently applied to all the data collected. Based on this first stage of analysis, we were able to develop a comprehensive view of the company's SBMI process as a triple-pathway model, which comprised stage setting, intrapreneurial creativity and experimentation, followed by engagement for implementation.

The results from this first stage of data analysis were presented to and discussed with the members of the Business Innovation team on October 10, 2022, and with the members of the other business units on November 29, 2022. These interactions enabled us to validate our understanding of the triple-pathway model and observe the team's reactions to our findings. Notably, these discussions revealed that the process of engagement in SBMI exploration projects was a subject of particular interest to the team and evidently a critical step in the new BM transformational efforts.

In the second stage of analysis, we dug deeper into elements related to employee engagement and perceptions of SBMI. This stage generated several second-order codes from the thematic grouping of the themes from the first round of analysis. Based on these second-order codes, we developed aggregate themes that highlighted factors relevant to the process of

engagement. In developing these themes, we drew heavily on the work of Kahn (1990) and of other researchers presented in our theoretical section. The result of this stage of analysis was identification of two themes which underpin engagement- meaningfulness and complementarity.

Findings

Based on our data analysis, we first identified the comprehensive process of transforming an organization through SBMI. The findings reveal a triple-pathway model, which begins with top management setting the stage by establishing and mandating the business innovation team. This is followed by employees responding with intrapreneurial creativity and proposing various projects based on their skills and aspirations. It then culminates in experimentation, where employees test their BM ideas. This process, along with the implementation of the model, is grounded in active employee engagement, as evidenced by their collective efforts to secure organizational support. At a deeper level, our findings examine the underlying factors that drive this engagement – specifically the roles of meaningfulness and complementarity. We explore these insights further in the following sections.

A triple pathway to SBMI

Setting the stage by management

The goal of the new business innovation team is to develop a diverse portfolio of new BMs. An internal document outlined the main principle of the new business innovation approach as being to *"identify new models of value creation in existing or new markets"* (Alpha 1). As a longstanding nuclear fuel company, the focus had been on core activities directed at major players in the market, with little consideration of smaller players. The small players had been previously identified as potentially beneficial to the group, but no real solution had been developed to exploit the options, as one respondent stated: *"These were customers who had already been identified for several years within* OCLEA*, but they realized that there was no*

dedicated department to serve these companies…and that a change to service management had to be put in place to be able to offer them solutions" (Alpha 4). Management thus envisioned this new team and associated business innovation approach as a way to foster diversification into a new mindset of service from the group which complimented the offerings already in place. To achieve this, there was a need to offer the employees a level of freedom to enable them to operate beyond the confines of working for a mature industry. This managerial directive is captured in the following quote:

"So, on the one hand, I think it was a good fit with OCLEA's guiding principle, which was 'go out and find new customers, go out and find new markets and be bold, let's operate in start-up mode.' That's right, because it was also the trend in 2018-2019 to have start-ups hosted by the Group" (Alpha 2).

The new team and business innovation approach were considered as a new movement in the organization which gave employees flexibility to "try things out" by extending to new clients and new ways of doing in a manner akin to start-ups. The flexibility of this new business innovation approach is summarized by the following quote from a manager:

"In our organization, when it comes to strategy, we're generally asked to avoid screwing up, whereas in innovation, I think we're much more willing to accept mistakes, and therefore this is somewhat an iterative aspect…. innovation, by virtue of its function and philosophy, can more easily explore something and then go back on it" (Beta 7).

A corporate internal document defines the exploration process as follows: *"The objective of the exploration process is to gradually design and develop the value creation model. To achieve this, we alternate between stages of learning, business design, decision-making, and testing. Several iterations are necessary to design and ensure the reliability of the value creation model"* (Alpha2). The exploration and implementation process unfold in five distinct phases. The first phase, known as "initiate" focuses on designing value creation model scenarios and

generating initial lessons. Next is the “seed” phase, which aims to verify the alignment between value propositions and different customer segments, while continuing to develop the model. Moving forward, the “optimization” phase entails finalizing and validating the overall design of the value creation model to ensure its economic viability. The “build” phase then aims to finalize and construct the model in a modular manner, ensuring functionality through testing and validating growth mechanics before scaling investments. The process culminates in the “scale” phase, which emphasizes the expansion of the validated model. Finally, a “go or no go” decision concludes the process. This decision is primarily based on the economic feasibility and profitability assessments conducted by the end of the third phase. The four projects studied are at varying stages of development. Alpha is in the build phase, Gamma is in the optimization phase, and Beta and Delta are in the initiation phase.

Like all BMI projects in the portfolio, the four BMIs under study are based on a strategy of leveraging strong synergies with the core competencies that originate from the nuclear sector, as one respondent demonstrated: *“We have a technological edge thanks to our R&D in this field.”* (Beta 5). The resource allocation strategy starts with the resources that may be available and dynamically allocates them based on the progress of the exploration, the lessons learned and the reduction of uncertainties. For example, in terms of human resources, each project benefits from the involvement of one or two BMI project leaders from the business innovation team during the first three phases of exploration. Human resources from the business unit where the project is implemented are subsequently dedicated to its further development.

Intrapreneurial creativity from employees

Based on the stage set by the business innovation team, employees were welcome to propose projects that had the potential to generate new business for OCLEA with new client segments or alternative use of existing resources and skills. This is exemplified in the following quote from an employee:

"We saw this [the new business innovation approach] *as a way of diversifying, of reaching out to customers other than the 'usual suspects', EDF, CEA, and* OCLEA*'s own customers, to address the entire PNE segment, i.e. non-electronuclear producers. So, on the one hand, it met the challenge of going a little beyond what we're used to; and on the other hand, it fitted in well with the whole business innovation movement that was being launched at group level, which was, well... it's a little bit special, a little bit innovative, a little bit new, a little bit disruptive, to go try things out"* (Alpha 2).

As the quote shows, there was no precise and predetermined directives about what was expected as a new project; it could be disruptive, innovative, etc. The organizational conditions and resource allocation principles implemented by the business innovation team empowered employees to participate in these BMI projects without being concerned about any negative impact on their status or career.

In the case of Alpha, the project came from a need to use available labor resources during a period of slow activity in the business unit. The idea arose from a service the company had offered to a client: *"Historically, we had already had such customers, non-electronuclear customers. So, for example, the Saint-Louis hospital in Paris could call us to empty a reactor vessel."* (Alpha 3). This is a vessel that contains radioactive waste from different activities in the hospital. As a nuclear-based company, it has the competence to handle radioactive waste but this was not a service in its portfolio, as highlighted below:

> *"... So that's really the genesis of it, on one hand, there's a potential market where we've already done occasional work, and on the other hand, there are possibly additional resources that we won't be able to assign to projects. So, we need to find a solution… that's how we started reaching out to hospitals, research centers, and sometimes even analysis laboratories that also use radioactive processes in their analyses"* (Alpha 1).

The workers in this business unit had previously offered extra services to a client and, based on the new platform of the business innovation team, they were able to organize the idea into a creative new BM which engaged several new clients in the medical sector.

In the case of Beta, the idea came from an employee who was concerned about the heavy dependence of European industries on China as the principal supplier of rare earth magnets/metals, following a global crisis in 2012 which halted activities in Europe and the USA. When China switched to a long-term strategic position rather than taking an international business stance, there was European recognition that *"We're no longer in the business of buying and selling, we're also in the business of protecting our industries, especially our technology industries*" (Beta 7). Fueled by this new development in the environment and the call to be more innovative internally, the employee thought about the possibility of extracting rare earth magnets from uranium. As there was no internal competence for separating these magnets from uranium, the employee contacted a French company in La Rochelle where he had done his internship, and initiated an agreement: *"…I did my engineering internship there, and I knew them very well; And so we signed an initial agreement with them, … saying, if we find rare earths in these uranium deposits, we'll do business with you, to recover the rare earths"* (Beta 7). This initial partnership led to the launch of the project to recycle rare earth magnets from uranium. The project gained ground internally and more resources were allocated to it with the result that it became two major projects: *"There's a rare earths project and a rare earth magnets project*" (Beta 13) which have a common base interest. The idea grew, with increasing government and industry-wide participation in a project "…*not for recycling, but for the generation and separation of heavy rare earths…, and therefore to build a plant in France for this purpose."* (Beta 13).

The idea for the Gamma case came from an employee who was an integral part of the company's nuclear waste management R&D team. After realizing that the existing solutions in

the market were *"saturated and outdated,"* the employee came across research on a new technique and explained: *"That's when I came across research on hydrometallurgy, where we can recover materials. The process is just as costly, but we recover materials, some of which can be strategic. I found that interesting. So, that's where it started. We began working on it from a business model perspective. We didn't have the technology yet, but I first started working a bit on the strategy and then I brought in a student from the College of Engineers…So, we began developing the business model to see 'Is it profitable?', 'What's the market like?', 'What's the interest?', 'What can we capture?'"* (Gamma 16). The newness of the solution has put OCLEA in a pioneering position with the potential to gain market share in this new waste recycling methodology.

Finally, the Delta idea is linked to OCLEA's core activity and its greatest challenge – managing radioactive waste from its activities. This has a direct effect on the company's image. There had been discussions within the innovation team but there was a need for technical expertise to substantiate the desired efforts. As a member of the core team explained:

"There was a need for some technical expertise on certain issues, which is how he got involved in the new reactors topic. He found some interesting things and thought that, from an engineering perspective, we had something to contribute to these areas. So, he asked me to join him because, at the time, he was working alone on developing this activity, building up expertise, and trying to attract clients. I found it interesting, and at the beginning, it was just the two of us." (Delta 25). They developed some ideas around *"molten salt reactors"* and, with the help of the business innovation team, they presented the idea to start-ups, which then became early clients with small contracts directly with OCLEA. This was a major shift for the company because it was accustomed to large contracts with bigger players in the field.

In sum, based on the business innovation team's call for innovation and diversification of innovation efforts, employees reacted by adopting different types of intrapreneurial

creativity. The creativity of employees facilitates the conversion of private hobbies into potentially profitable business ideas and leveraging expectations of external stakeholders into new internal start-ups. This establishes employees as drivers of strategic new business directions for this mature company.

Experimentation

Experimentation entails giving employees the space to try out different versions of proposed projects without having any negative consequences for their position in the organization. The business innovation unit was essentially a maneuver room for seeing how a project idea could be further developed using different competences within the organization. In the case of Alpha, once the project had been initialized at the business unit level, they first experimented with nuclear medicine. However, as this did not work out, they pivoted to other centers, as highlighted below:

"We realized that in nuclear medicine, the radioisotopes used decay very quickly, so there aren't major issues with radioactivity and nuclear management… However, in all radiotherapy centers, where cancer treatment is done—particularly for the thyroid with iodine-131—there can be some issues… later. We realized that waste and material management wasn't digitized, so we wondered if it would make sense to offer a digital solution for waste management to these people. So, that's what we did next" (Alpha 1).

Along with experimenting with new clients, they also experimented with different versions of their business methodology to continuously improve the chance of success, as demonstrated by the following quote:

> *"So, we did several, well, what we call sprints…The idea is to have a business model, outline key hypotheses, and test the most critical ones first. Once we've completed an initial phase of field study, we revisit the business model and assess: OK, this one is validated, this one is not. Then, we ask ourselves, does our economic model change?*

Yes or no?" (Alpha 4).

These different experimentation efforts did not pose any threat to the job security of the employees as they were in addition to their core activities in the organization. However, with each success, the new BM gained strength and support from more employees. The common vision was to provide specialized nuclear-based services to these non-electro-nuclear partners.

In the case of Beta, following the initial agreement with the French company in La Rochelle, the price of uranium dropped drastically, causing the agreement to fall apart. Due to increasing concern from the government and big industry players like Airbus, who need the raw materials, the project became a priority but there was still a relative lack of knowledge of the matter, as the following quote shows: *"Basically, we started by doing some classic research on the Internet, ... which isn't necessarily easy given that there's a sizeable Chinese monopoly. Google is not necessarily the best place to find information on China. But with what we had, we started to think about business models"* (Beta 5 and 6). To foster growth in a context of limited knowledge, the government initiated a partnership with *CT*, a spinoff of the La Rochelle company, with OCLEA acting as the "industrial guarantor" with a bigger agenda: *"Then, one thing led to another. Beyond magnet recycling came the idea of creating a heavy rare earths processing hub in Europe, in order to have heavy rare earths available in Europe for European needs"* (Beta 13).

The Gamma experimentation is still in the early phase of concept optimization, with the proposed solution being tested in collaboration with an external partner before it enters the build phase. This is same for Delta, whose BM, according to one respondent, is *"more generic, meaning we really approach it through iteration"* (Delta 20).

In summary, experimentation enables the new BM idea to be tested using different skills and competences to find potential growth paths for the idea. It also enables the scope of the project idea to change in line with the needs and expectations of external partners, as happened

with Beta when building a European hub for rare earth metals. The key characteristic here is the flexible involvement of multiple stakeholders under the banner of trial and error, where there are no negative consequences from any errors made but there is a desire to learn from mistakes and keep pushing the BM idea forward.

Once the exploration of a new business model is given a green light, the next step is to ensure the participation of organization members without the core activities being affected. A deliberate effort is required to involve as many collaborators as possible and develop organic buy-in from different players with different competences. Employee engagement thus becomes a critical component of the transformation process.

Engagement for rallying internal support and participation

Given the importance of employee engagement in mobilizing internal support and participation, we will now demonstrate how meaningfulness and complementarity fuel this engagement in the BMs studied.

Complementarity

A significant risk associated with BM transformation within incumbent firms is the potential for new models to cannibalize the core business. As discussed earlier, in our case, the strategy for developing the BMI portfolio focuses on leveraging synergies with the core competencies in the company's historical nuclear activities. This approach to ensuring complementarity between the new BM and OCLEA's core operations has become a shared vision and a standard practice within the SBMI process. Thus, when discussing the potential existence of conflicts and cannibalization with one participant in development of the Gamma BM, he immediately responded: *"In the business unit we haven't identified any conflicts, rather, we've found synergies"* (Gamma 15). The same applies to the Alpha case, where a participant explained how this new BM was built on a logic of synergy with the resources and competencies developed by the group in its historical activities: *"The work we do through Alpha is the classic*

work we do at OCLEA. In the end, we work with different customers; customer processes are streamlined compared to what we usually do; Alpha calls on our design department to carry out pre-projects, and so on. So, in terms of synergy, Alpha relies heavily on the resources ultimately made available by the OCLEA organization" (Alpha 3).

This complementarity was also emphasized by one of our interviewees in the Delta case: *"I believe that OCLEA has expertise and industrial capacity that are quite unique, and the Delta project aims to highlight this expertise, which, as a result, is unique even on a global scale. I think the Delta project is based on existing expertise, which can always be further developed and improved, but it is grounded in existing know-how"* (Delta 20).

Complementarity between core business and new BMs emerged as a key shared vision initially proposed by the teams responsible for developing the new BM portfolio and later adopted and championed by all participants in the SBMI process. This shared vision of complementarity enables employees to participate in new BM projects without fearing any negative impact on their professional identity, which is often seen as a risk in the process of transformative BM changes.

While the initial concept of complementarity between the core business and the new BMs was introduced by management, the second aspect – complementarity between economic, environmental and social value – was emphasized by the employees. Our findings revealed a shared desire among the employees interviewed for new BMs that integrate value propositions with three complementary logics: economic, environmental and societal logics. This multifaceted view of value is echoed throughout the organization and explains why employees actively invest in these projects. The shared vision that motivates their engagement is grounded in their expectations about the sustainable impact of these models. However, employees are also fully aware that economic viability is crucial for securing the approval of the business unit.

As one participant from the Beta BM project explained: *"For me, sustainability has an economic dimension. The project needs to be profitable. That is to say, the investment we make should yield returns in the end. (...) And then there's the dimension of having a positive social impact on the regions. And having the smallest possible impact on the environment."* (Beta 5). In defining an SBM in this way, the employee emphasized the complementarity between social and economic goals.

This vision is not limited to individual employees but is collectively shared. Similarly, a Delta participant explained: *"I think that, while it's true that at the outset the economic value – well, the technical and economic value – took precedence, so that this project could be included in the portfolio and be considered as an exploration opportunity. As soon as we knew that we could, on paper, put the technical process in place, the business model immediately switched to the acceptability value of nuclear power, which is more societal and environmental"* (Delta 19).

Employees viewed economic, environmental and social values as being complementary, a perspective that contrasts with findings in other contexts, such as start-ups and social enterprises, where the social transformation foreshadows the BM transformation. In our case, due to the established and mature nature of the organization, it is difficult to completely shift away from an economic-centered approach in driving transformation efforts.

Meaningfulness

Our findings indicate that employees perceive environmental and social impact to be key motivators for engaging in the SBMI process. They anticipate outcomes such as access to decarbonized energy, the development of a circular economy, enhanced nuclear waste management, support for the ecological transition and more affordable electricity through these new BMs. By participating in these SBMI projects, employees derive a deeper sense of purpose from their work, enhancing their perception of its societal contribution and value. As one Beta

project participant remarked: *"Who is the business model aimed at? It's for our societies striving for a sustainable future, with renewable resources in a clean environment"* (Beta 7). Another participant from the same SBMI project added: *"I think it's good for everyone to have electricity that can charge cars in a clean and quiet world, with materials that are recyclable. That's definitely beneficial for society and communities"* (Beta 8). Similarly, an Alpha project participant emphasized: *"From an environmental standpoint, we're dealing with radioactivity, so, naturally, the environmental aspect is crucial. We collaborate with waste disposal sites, where radioactivity is often present. Alpha's capacity to isolate and safely transfer it to specialized companies has a positive environmental impact. In that sense, we're helping to clean the planet a little"* (Alpha 4).

These statements highlight that employees perceive their participation in these BMs as an opportunity to contribute meaningfully, thereby strengthening their commitment to the transformation process. The pursuit of meaning, particularly through their contribution to society, plays a significant role in employee motivation. In seeking purpose, they may prioritize societal benefits over personal gain, which justifies their involvement in SBMI initiatives. Furthermore, the visibility of their social impact is crucial to this sense of meaning; employees are more likely to engage when they can clearly observe and demonstrate the positive societal outcomes of their work. A heightened sense of prosocial impact enhances employees' subjective experience of meaningfulness when participating in these SBMI projects.

Participation in SBMI projects both strengthens employees' sense of societal contribution and personal value and enhances their self-perception by aligning with their preferred self-image. One participant in the Beta project explained that his involvement in this project, which focuses on recycling and establishing a circular economy supply chain, helped to reshape the stigmatized image of his company's nuclear industry: *"Highlighting the social aspect within the company is also important because we are strongly associated with the nuclear industry.*

Being able to say that we are also committed to recycling materials that matter to everyone and contributing to the circular economy is important from a social perspective" (Beta 12).

Another employee involved in the Delta project echoed this sentiment: *"The value we offer is to reduce waste, make nuclear energy cleaner and more acceptable, and, for me, the most important aspect is the dimension of acceptability"* (Delta 20). By improving the social acceptability of nuclear energy, this project enables employees to cultivate more appealing identities that align with their preferred self-image. Participation in these SBMI initiatives enables employees to reshape the negative, stigmatized narrative surrounding the nuclear industry. This tendency is especially strong in industries that have been historically perceived as harmful to society, where employees are particularly driven to reframe their work as socially beneficial.

The opportunity to cultivate more positive identities within the nuclear industry, coupled with the perception of meaningful societal outcomes from their work, fosters a sense of importance and purpose among employees. This, in turn, motivates employee engagement in the company's transition through a portfolio of SBMI projects.

Discussion

Our case study of transformative SBMI within an incumbent firm underscores the pivotal role of employees as initiators and drivers of sustainable change in an incumbent firm. We show that this process is driven by a collaborative approach, where top management provides the foundation and the intrapreneurial creativity and experimentation of employees shape the development of a new portfolio of SBMs. The success of this transformation hinges on employee engagement. Our findings identify two key mechanisms—complementarity and meaningfulness—that foster this engagement throughout the process. We make several contributions to SBMI literature through these insights.

A bottom-up collaborative approach to transformative business model innovation

In understanding SBMI as a transformative process in incumbent firms, we seek to move the extant literature beyond its focus on being a response to disruptive technological changes in the external environment (Cozzolino et al., 2018; Heij et al., 2024; Snihur et al., 2018) and embedded in corporate strategic outcomes (Inigo et al., 2017; Pinkse et al., 2024; Schupfer and Soppe, 2025) towards a more tactical employee-led approach. The perspective of responding to disruptive changes portrays incumbents as "playing catch-up" through various response strategies, such as heavy investments to advance their technological capabilities, leveraging organizational ambidexterity and acquiring or partnering with new entrants (Bauer and Friesl, 2024; Heij et al., 2024; Riandita et al., 2025). Our study offers an organic view of transformative BMI in incumbents which results from a need to diversify and pre-hedge against uncertainty rather than reacting to disruption in the business environment.

Transformation here entails deliberate changes to existing BM that can be achieved through novel value creation and capture from external sources like new suppliers and new activities. For the employees of these incumbent firms, transformational efforts come at the challenge of a possible cannibalization of core activities and loss of their occupational identity (Kim and Min, 2015; Kirtley and O'Mahony, 2023; Snihur et al., 2018). Previous works have identified top management directives as pivotal in mitigating these challenges (Loon et al., 2020; Narayan et al., 2021). In this vein, management leverages employees' know-how to address these challenges as further commitments to corporate strategic orientations (Achtenhagen et al., 2013; Roome & Louche, 2016). Other researchers have highlighted strategic hiring and training actions from human resources as worthwhile solutions (Loon et al., 2020) or a consideration of strong person-organization fit as essential for successful implementation of transformative BMs (Menter et al., 2024). Our study contributes to this body of works by revisiting the strategic role of employees in not only mitigating these challenges but rising to become champions of BM transformational efforts.

In this study, we demonstrate how employees, in collaboration with top management, engage in a "triple pathway" to facilitate the development and implementation of a new portfolio of transformative BMs. Top management adopts a facilitator role in defining the mandate and the core principles, such as aligning the new BM with synergies from the existing core business, while employees generate ideas though creative intrapreneurship associated with high levels of agency (Reischauer et al., 2025). Employees adopt a start-up mentality allowing them to reconfigure their skills and expertise in generating novel ideas for the new BMs. Intrapreneurship highlights the proactiveness of employees to create new value from different activities or reconfiguration of existing activities (Zott and Amit, 2010). Intrapreneurship in similar contexts are usually plagued with major resource constraints (Halme et al., 2012). In our study, employee's intrapreneurship leveraged their downtime as was the case of Alpha or new government directive backed by external resources as was the case of Beta. Intrapreneurial efforts encourage iterative experimentation to refine the business model idea (Bojovic et al., 2018) and subsequent learning through repeated trial and error (Sosna et al., 2010), engaging different competences and resources across the organization to augment the potential profitability of the model. The resulting SBM is therefore an outcome of the employees' engagement through creativity and participation from colleagues leveraging resources beyond their business unit but within the expertise of the organization. Hence, the development and advancement of new BMs for value creation is not dictated by corporate strategic guidelines rather, it is collaboratively constructed with employees, who view SBMI as an opportunity to cultivate more positive identities within the nuclear industry while simultaneously perceiving meaningful societal outcomes in lieu of the energy and climate crisis.

Meaningfulness as a dynamic embedded driver of sustainability

Kahn (1990) conceptualized meaningfulness in light of employees' perceptions of their role as contributing to organizational and personal goals. Meaning in itself is a product of

individual interpretations of the context (Sanasi et al., 2024) and perception of the value gained (Norris, 2024). The conceptualization of employee's meaningfulness as rooted in personal and organizational goals thus obscures a significant dimension of employees' perception, expressed as their interests in fostering a better society in the face of global challenges like climate change (Voegtlin et al., 2022). Employees draw on their moral imperatives to make a difference to society by aligning with the responsible innovation intent to avoid harm and improve conditions for people and the planet. To materialize these positive societal intentions, employees draw on their organizational context and expertise to develop new creative solutions that serve a collective goal and purposely redefine their organizations (Rauch and Ansari, 2021). Our study shows that, for OCLEA employees, meaningfulness is rooted in the need to create a better society where nuclear waste is safely managed, recycled to reduce over exploitation and positively recognized as a clean and acceptable alternative energy source to fossil fuel in parallel of renewable energy sources. In this pursuit of meaningfulness, these employees engage in creative new activities that embody a higher sense of purpose (Martela, 2023), as in the case of Alpha, or introduce new processes that enable them to exploit new opportunities to reduce negative externalities and promote social and environmental gains (Peerally et al., 2019; Spieth et al., 2019), as in the case of Beta and Gemma. In this context, management did not define upfront any sustainability agenda, but the nature of the organization and its societal implications propelled employees to develop an embedded dimension of meaningfulness in protecting and improving societal wellbeing. This new dimension of meaningfulness positions employees' creativity and bricolage to contribute to sustainable innovation in the new BMs. We thus contribute to the SBMI literature by showing that sustainability is a byproduct of the psychological condition of meaningfulness. Thus, without the societal element of meaningfulness, employees would engage in business model innovation generating ideas not necessarily sustainable in nature.

In addition, following Florian et al. (2019), our study demonstrates that the concept of meaningfulness is influenced by broader societal discourse and evolves in response to shifting narratives and organizational contexts. Employees do not exist in a bubble but systematically draw on contextual resources to define their work as meaningful (Bailey and Madden, 2017) and subsequently redefine their sense of meaningfulness with shifting discourse and circumstances (Cohen et al., 2019). This perspective highlights the fluid nature of meaningfulness, suggesting that its motivational impact is shaped more by contextual factors than by individual characteristics. In our case, employees build their notion of meaningfulness around the discourse of climate change and energy safety, changing circumstances in light of risk of nuclear accident and geopolitical tensions associated to energy. Due to the context and societal discourse that shape its sense, meaningfulness should be understood as a dynamic embedded social condition rather than just a psychological predisposition. This nuanced view underscores the necessity for organizational stakeholders to continually adapt their strategies in line with evolving contexts and discourses (Reischauer et al., 2025).

Shared vision as a balancing act

While existing BMI literature underscores the importance of strong managerial and employee commitment to a shared vision in supporting the innovation process (Achtenhagen et al., 2013; D'Amato & Roome, 2009; Roome & Louche, 2016), it inherently assumes engagement to be a result of strategic directives (Barrick et al., 2015) or social contagion (Torrente et al., 2012). Our study contributes to this literature stream by demonstrating how a nuanced view of employees' sense of meaningfulness, along with perceived complementarity, facilitated the emergence of a shared vison towards engagement in an incumbent organization. As already discussed above, meaningfulness goes beyond a psychological condition to include social aspects of improving societal wellbeing and reducing environmental consequences of nuclear as an energy source. This social perspective is common to all employees as members

of the society. This commonality creates a shared understanding of the new BMs as potential solutions to persistent societal problems (Perri and Rocha, 2024; Voegtlin et al., 2022). The notion of meaningfulness also changes with societal discourse around the energy crisis and larger climate change considerations thereby sustaining the interest and participation from other colleagues across departments in the organization. Employees are not obliged to engage with the new BMs, but their need to balance a wholesome-self that caters for personal, organizational and societal contributions (Martela, 2023) fosters and sustains their involvement in these new sustainable models.

On the other hand, complementarity entails the psychological conditions of availability and safety. According to Khan, (1990) safety focuses on self-expression with no negative consequences on employee's status, while availability entails having the right resources needed to efficiently invest oneself in role performance. When established organizations engage in innovation, such as SBMI or green innovation, resource availability emerges as a critical challenge (Reischauer et al., 2025). When such innovations are initiated at the core of the organization, access to resources is generally secured. However, when they emerge at the periphery without explicit board support, obtaining necessary resources becomes significantly more difficult. In our case, the business model innovation approach is staged by management as a means to foster diversification while capitalizing on strong synergies with core competencies. This approach provides employees with the flexibility to experiment, ensuring that innovative projects remain aligned with core activities facilitating access to available resources.

Concurrently, the notion of safety ties in with inertia characteristic of employees in incumbent firms (Kirtley and O'Mahony, 2023) not willing to rock the boat or adopt new activities that might cast a shadow on their proven track record of competence. This is not the case in our study as employees especially long tenured employees embraced the new normal as

a way to express their competence beyond their proven records. This was the case of Gemma, where the pioneering employee utilized their expertise to develop a new methodology to handle nuclear waste, a major concern for the industry. The underlying goal is the need to balance core expertise with the activities of the new BM which is the first element of our notion of complementarity.

Another principle underlying complementarity is the notion of synergy between the triple goal of profit, planet and people adopted by employees in their engagement efforts. This ties in with the notion of availability as employees are cautious about fostering impactful changes from their engagement with the new models but the models can see the light of day conditioned by profitability. Employees intrapreneurship efforts harnesses a combination of resources both human and capital to ensure progress on all three objectives which in turn attracts more resources and participation. Shared vision on the new BMs hinges on a balancing act between core expertise with new activities and encompasses a balanced amount of resources to attain economic, social and environmental goals.

Practical implications

Our work presents some practical implications. First, we advocate for greater flexibility in incumbent firms to facilitate a culture of intrapreneurial creativity. Incumbents have long-tenure employees with great expertise but who have the potential for inertia, which stifles innovation. By creating an atmosphere of trial and error shrouded in learning (Sosna et al., 2010), such firms can motivate employees to develop alternative creative solutions to diversify or achieve prescribed or aspired sustainable transformation. Second, a culture of intrapreneurial creativity should be accompanied by adequate governance structures that ensure employee safety (Ambos and Tatarinov, 2022). Finally, we advocate for incumbents to introduce slack in employees' time management as this would facilitate collective collaboration on new

transformative projects. This would guarantee involvement in responsible innovation without jeopardizing the employees' core responsibilities and expectations.

Conclusion

This paper contributes to the extant research on SBMI by examining the role that employees play in the sustainable transformation process in an incumbent firm. Although social transformation was not a direct managerial objective, employees subscribed to an embedded social notion of meaningfulness when engaging in intrapreneurial creativity and experimentation which culminated in SBMs. Our study demonstrates a bottom-up collaborative approach to sustainable transformation, which is steered by meaningfulness and complementarity and which takes account of the safety and availability of employees (Kahn, 1990).

Our study has limitations which offer opportunities for future research. First, our case stems from the unique context of nuclear energy which encompasses clean energy but at the same time being controversial due to its negative reputation related to nuclear waste management, industrial disaster and nuclear weapon proliferation. While this case allowed us to reveal an employee engagement process in sustainability transformation, future research could look at energy intensive sectors such as artificial intelligence and other sectors with perceived potential negative environmental impact such as chemical or agricultural fertilizer industries. It could also consider how employees can engage in transformation efforts and the shifting meaning they ascribe to their work. Also, while our study looks at the initial development stages of new BMs, future studies could focus on the development and implementation stages to more comprehensively assess employee engagement from conception to desired outcome, tracking their meaningfulness throughout the process.

In conclusion, our study provides foundational knowledge for understanding the transformative process in an incumbent firm and the significant role that employees as non-strategic actors can play in initiating and championing sustainable transformation.

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Table 1 – Informants

Portfolio business model	Position	Interview codes in text
Alpha	BMI project leader Innovation business leader Business unit manager Business model implementer	1 2 3 4
Beta	BMI project leader Innovation business leader Business unit manager Business model implementer	5 6 7 8 9 10 11 12 13
Gamma	BMI project leader Innovation business leader Business unit manager Business model implementer	14 15 16 17 18
Delta	BMI project leader Innovation business leader Business unit manager Business model implementer	19 20 21 22 23 24 25

Table 2 – Data sources and use in analysis

Source	Type of data	Use in analysis
Semi-structured interviews	25 semi-structured interviews with 25 respondents, May to September 2022	Track the process of four new BMs. Fine-grained tracking of employee engagement and perceptions of SBMI.
Internal documents	Five corporate documents presenting the portfolio management principles (D1), the business model exploration process (D2), the value network of the BMI (D3), the BMI portfolio (D4), and the BMI portfolio and Key Performance Indicators (D5). Two internal documents used during reviews of the Alpha BMI to present the project and its evolution (D6 and D7).	Fine-grained tracking of the portfolio management principles and content. Fine-grained tracking of the four BMI processes. Triangulation of informants' assertions and recollections.

	Four internal documents used during reviews of the Beta BMI to present the project and its evolution (D8, D9, D10, and D11). Two internal documents used during reviews of the Gamma BMI to present the project and its evolution (D12 and D13). Four internal documents used during reviews of the Delta BMI to present the project and its evolution (D14, D15, D16, and D17).	
Participant observations and non-participant observations	Informal meetings with the manager of the business innovation team and various members of the team. Observation of meetings in situ. Observation of daily activity in situ.	Establishing trust with informants, becoming familiar with the context, facilitating understanding of the portfolio management, discussing findings.